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1. GENERAL INFORMATION

1-1. Product Description

The GVC Media Technology Inc. Model: SW304 (referred to as the EUT in this report) is an ISA slot Base, 16-bit, stereo sound music card. It integrates a lot of circuitry which designed for the purpose of enhancing a PC into a perfect sound/music workstation.

It has a built-in microphone amplifier and two jacks (microphone and Line-In jack) allow user to record or digitize any kind of sound by using a normal microphone.

It also comes with a built-in stereo power amplifier that can drive speakers or headset directly.

Finally, it comes with a standard joystick port and built-in MIDI interface.

Detail product features please refer to the user's manual attached.

1-2. Related Submittal(s) / Grant (s)

This submittal is intended for filling a class II permissive change for the certified FCC ID : M4CS0038 (data of grant January 30, 1998)

Modifications (difference) between the current version and the initial certified version is the Wave Table circuit block. This functional block (Wave Table circuit) has been deleted in current version. (please refer to the block diagram and/or photos of previous application)

The change(s) will be made only in those units produced after the change is authorized.

1-3. Tested System Details

The FCC IDs for all equipments, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model No.	FCC ID	Equipment	Cable
SW304 ⁽¹⁾	M4CS0038	Sound Card	refer to next P.11.
Vectra VL 5/75 Series3	K4UVECTRAVL5	PC	Un-Shielded Power Cord
NE64	KFBNE64	Monitor	Shielded Data Cable ⁽²⁾ Un-Shielded Power Cord
HP2225C+	DSI6XU2225	Printer, Parallel I/F	Shielded Parallel Data Cable Un-Shielded Power Cord
AT-1200CK	E2O5OV1200CK	Modem, Serial I/F	Shielded Serial Data Cable Un-Shielded Power Cord
FDA-102A	F4Z4K3FDA-102A	Keyboard	Shielded Data Calbe
SERIES.2-7S	DZL6QBS2	Mouse	Shielded Data Calbe
GRS-455	N/A	Speakers	Un-Shielded Audio Cable
KT-V860	N/A	Walkman	Un-Shielded Audio Cable
KA-309K	N/A	Microphone	Un-shielded Audio Cable
8257	N/A	Joystick	Shielded Data Cable

Notes:

(1) EUT submitted for grant.

(2) Monitor's attached video cable without ferrite core.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992)/CISPR22(1996). Radiated testing was performed at an antenna to EUT distance 10 meters.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 5, All 2, Lane 220, Kang Lo St., Nei Hwu, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Feb. 4, 1998 Submitted to your office, and accepted in a letter dated March 26, 1998 (31040/SIT-1300F2).

3. System Test Configuration

3-1. Justification

The system was configured for testing in a typical fasion (as a customer would normally use it). The Sound Card was inserted to support equipment-personal computer. Peripherals of PC, such as monitor, keyboard, modem, printer, microphone, speakers, walkman, joystick and mouse were contained in this system in order to comply with the ANSI C63.4/CISPR 22(1996) Rules requirement. The PC operated as 75 MHz processor clock speed and in the default 640x480/31.5KHz VGA graphic mode. This operating condition was tested and used to collect the included data.

The second serial port(COM2) was tested in addition to the first port(COM1) per ANSI C63.4, second paragraph. The simultaneous testing of this identical port did not take the system out of compliance. Therefore, the final qualification testing was completed with each COM1 port connected by a stand along modem simultaneously.

3-2. EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read from mass storage device (HDD).
2. Send "H" pattern to video port device(Monitor).
3. Send " H " pattern to parallel port device(Printer).
4. Send " H " pattern to COM port device (Modem1).
5. Repeated from 2 to 4 continuously.

As the Keyboard, Microphone, Walkman, Joystick, and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

N/A

3-4. Equipment Modifications

In order to achieve in compliance with Class B levels, the following change(s) were made by NEUTRON test house during the compliance testing:

Please refer to next page as the modifications described and cross refence of photos of tested EUT.

The above modifications will be implemented in all product models of this equipment.

Applicant Signature :**Date :** March 10, 1998**Type/Printed Name :** Steven Shen**Position :** Supervisor

GVC Media Technology Inc.

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Modification Report

Company:

Model No.: SW304

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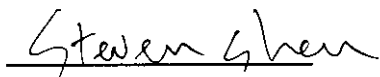
FCC ID: F4CS0038

Date: March 23, 1998

A Add Capacitors (C=103pf) on the pin 1 、 8 、 9 of game port

All the above modification will be implemented and relayed in the mass production to meet the FCC Class B requirements.

Gvc Media Technology Inc.



Steven Shen

Supervisor

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable and power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr.	Model/Type No.	I/O Port	FCC ID	Remark
E-1	Sound Card	GVC	SW304	Card Slot	M4CS0038	EUT
E-2	PC	HP	Vectra VL 5/75 Series3		K4UVECTRAVL5	
E-3	Monitor	Chern-Yih	NE64	VGA Port	KFBNE64	
E-4	Printer, Parallel I/F	HP	HP2225C+	Printer Port	DSI6XU2225	
E-5	Modem, Serial I/F	Datatronics	AT-1200CK	Com Port	E2O5OV1200CK	
E-6	Keyboard	Forward	FDA-102A	PS/2 Port	F4Z4K3FDA-102A	
E-7	Mouse	Logitech	SERIES.2-7S	PS/2 Port	DZL6QBS2	
E-8	Speakers	N/A	GRS-455	Line OUT	N/A	
E-9	Walkman	N/A	KT-V860	Line in	N/A	
E-10	Microphone	N/A	KA-309K	Line in	N/A	
E-11	Joystick	N/A	8257	Game Port	N/A	

Remark:

- (1) Unless otherwise denoted as EUT in 'Remark' column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as ※ in 'Remark' column, Neutron consigns the supporting equipment(s) to the tested system.

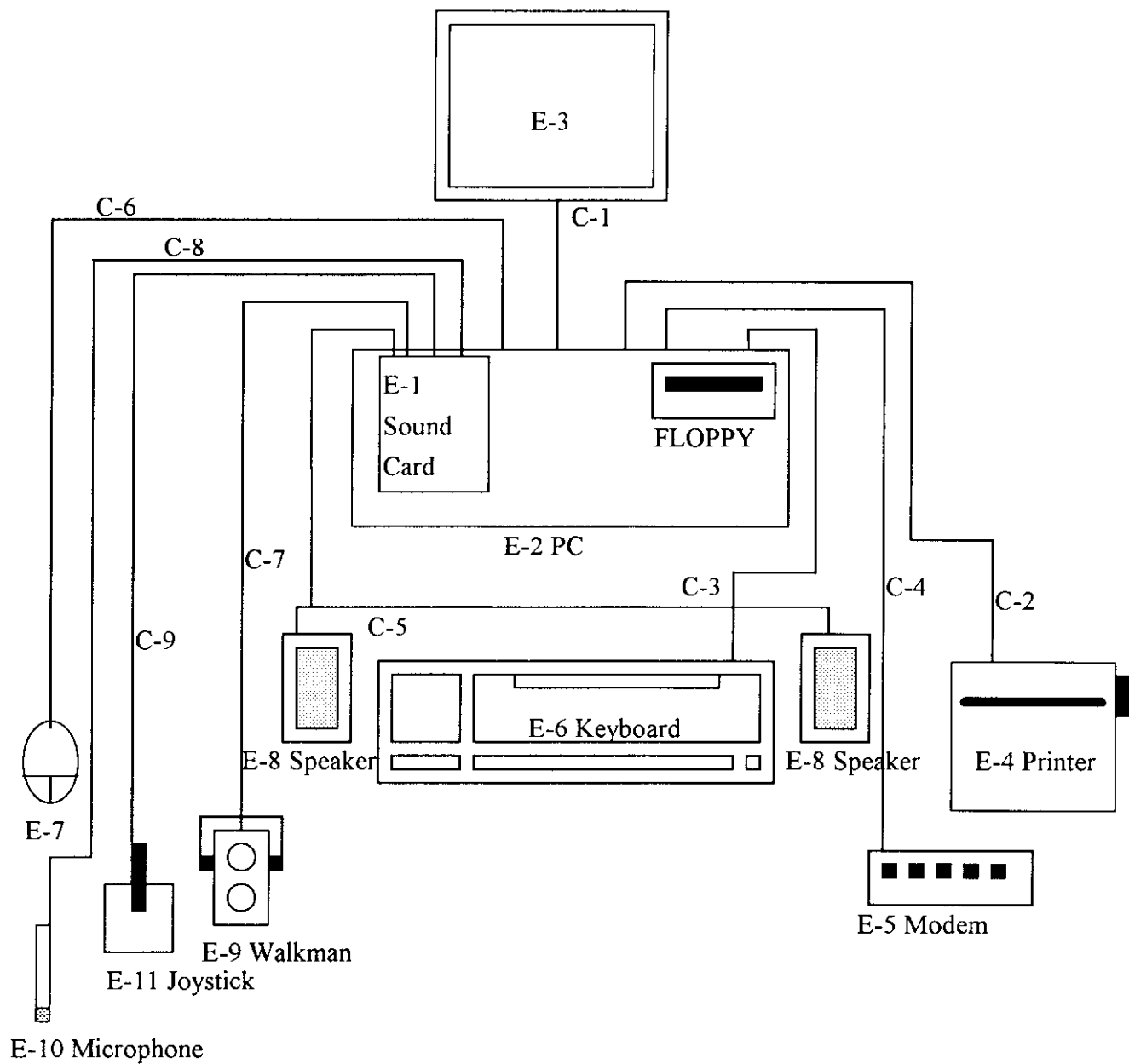
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded	Ferrite	Detachable / Permanently	Note
C-1	Video Cable	PC-Monitor	Yes	No	Permanently attached	
C-2	Centronics Cable	PC-Printer	Yes	No	Detachable type	
C-3	Keyboard Cable	PC-Keyboard	Yes	No	Permanently attached	
C-4	RS-232 Cable	PC-Modem	Yes	No	Detachable type	
C-5	Speaker Cable	EUT-Speaker	No	No	Detachable type	
C-6	Mouse Cable	PC-Mouse	Yes	No	Permanently attached	
C-7	Walkman Cable	EUT-Walkman	No	No	Detachable type	
C-8	Microphone Cable	EUT-Microphone	No	No	Permanently attached	
C-9	Joystick Cable	EUT-Joystick	Yes	No	Permanently attached	

Note:

- (1) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

Figure 3.1 Configuration of Tested System



4. Block Diagram(s)

Figure 4.1 Block diagram of system, Page 13.A

6. Conducted Emission Datas

- 6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

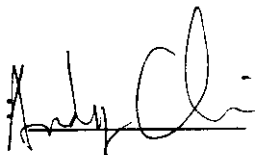
Judgement: Passed by **-8.3 dB** in mode of **Neutral** terminal **19.65 MHz**

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins (dBuV)	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		Note
0.22	L	46.40	44.10	62.82	52.82	- 8.72	(AV)
0.47	L	37.10	34.80	56.51	46.51	-11.71	(AV)
2.42	L	39.70	37.20	56.00	46.00	- 8.80	(AV)
14.39	L	43.20	*	60.00	50.00	-16.80	(QP)
14.42	L	41.00	*	60.00	50.00	-19.00	(QP)
0.22	N	46.10	43.90	62.82	52.82	- 8.92	(AV)
0.42	N	39.70	37.30	57.45	47.45	-10.15	(AV)
2.24	N	39.90	37.50	56.00	46.00	- 8.50	(AV)
11.98	N	44.00	41.50	60.00	50.00	- 8.50	(AV)
19.65	N	43.80	41.70	60.00	50.00	- 8.30	(AV)

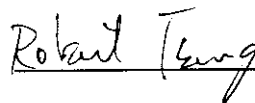
Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz, VBW =100KHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz, VBW=10Hz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 'Note'. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a "*" marked in AVG Mode column of Interference Voltage Measured.
- (3) Measuring frequency range from 150KHz to 30MHz.

Review



Test Personnel. :



Date:

March 10, 1998

7. Radiated Emission Datas

- 7.1 The following data lists the significant emission frequency, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by **-4.02 dB** in polarity of **Vertical 67.76 MHz**

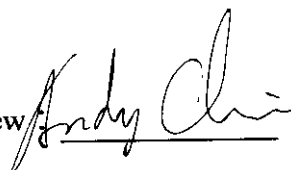
Table 5-2 Radiated Emission Data

(MHz)	H/V	(dBUV)	(dB)	(dBUV/m)	(dBUV/m)	(dBUV/m)	Note
43.30	V	12.80	11.80	24.60	30.00	- 5.40	
48.00	V	12.60	12.08	24.68	30.00	- 5.32	
57.90	H	13.70	10.15	23.85	30.00	- 6.15	
67.60	H	16.50	8.22	24.72	30.00	- 5.28	
67.76	V	17.80	8.18	25.98	30.00	- 4.02	
129.30	H	10.20	13.05	23.25	30.00	- 6.75	
202.40	V	11.50	12.32	23.82	30.00	- 6.18	
202.40	H	10.30	12.32	22.62	30.00	- 7.38	
220.00	V	11.40	11.76	23.16	30.00	- 6.84	
220.00	H	11.70	11.76	23.46	30.00	- 6.54	
228.80	V	12.00	11.92	23.92	30.00	- 6.08	
228.80	H	11.80	11.92	23.72	30.00	- 6.28	

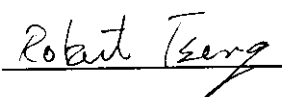
Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 'Note'. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .

Review



Test Personnel. :



Date:

March 10, 1998

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB Then:

1. The Correction Factor will be calculated by

$$\text{Correction Factor} = AF + CF - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$FS = RA + \text{Correction Factor} = 23.7 + 8.3 = 32 \text{ (dB}\mu\text{V/m)}.$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\text{Log}^{-1} \left[(32.0 \text{ dB}\mu\text{V/m})/20 \right] = 39.8 \text{ (uV/m)}$$

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.20
35.00	10.80	0.00
40.00	11.20	0.40
45.00	11.50	0.40
50.00	11.30	0.90
55.00	10.50	0.00
60.00	9.90	0.00
65.00	8.70	0.20
70.00	7.60	0.00
75.00	6.40	0.50
80.00	6.10	0.10
85.00	7.00	0.80
90.00	8.00	0.30
95.00	10.00	0.40
100.00	11.20	0.60
110.00	12.60	0.60
120.00	13.00	0.60
130.00	12.50	0.50
140.00	12.00	0.20
150.00	12.00	1.00
160.00	13.20	1.20
170.00	14.80	1.60
180.00	16.30	1.90
190.00	17.00	1.90
200.00	17.30	1.40
225.00	10.50	1.10
250.00	11.70	2.00
275.00	12.80	2.40
300.00	14.50	2.40
325.00	14.00	1.90
350.00	14.20	2.40
375.00	14.60	2.90
400.00	15.10	2.70
450.00	16.20	3.20
500.00	17.60	3.70
550.00	17.80	3.90
600.00	18.40	4.30
650.00	19.50	4.00
700.00	20.80	4.10
750.00	20.50	5.30
800.00	21.10	5.90
850.00	22.40	5.80
900.00	23.50	5.50
950.00	24.00	6.30
1000.00	24.80	5.20

8. Photos of Tested EUT:

1. Photo EUT 1 Front View
2. Photo EUT 2 Rear View
3. Photo EUT 3 Side View